510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
DEVICE ONLY TEMPLATE

A. 510 (k) Number:
K041534

B. Purpose of Submission:
To add Telithromycin to the Sensititre® *Haemophilus/Streptococcus pneumoniae* HP MIC Susceptibility plate and the Sensititre® 18-24 hour MIC Susceptibility Plate-gram positive panel.

C. Analyte:
Telithromycin (0.002-16 ug/mL) AST

D. Type of Test:
Quantitative Antimicrobial Susceptibility Test (AST) growth based fluorescence

E. Applicant:
TREK Diagnostic Systems, Inc.

F. Proprietary and Established Names:
Sensititre® *Haemophilus/Streptococcus pneumoniae* (HP) MIC plates and Sensititre® 18-24 hours Susceptibility Plates

G. Regulatory Information:

1. Regulation section:
   866.1640 Antimicrobial Susceptibility Test Powder
2. Classification:
   II
3. Product Code:
   JWY-manual readings of AST testing of >16 hour incubation
   LRG Automated readings of AST of >16 hour incubation.
4. Panel:
   83 Microbiology

H. Intended Use:

1. Intended use(s):
   The Sensititre® *Haemophilus influenzae/Streptococcus pneumoniae* plates are *in vitro* diagnostic products for clinical susceptibility testing of *Haemophilus influenzae* and *Streptococcus pneumoniae.*

   The Sensititre® 18-24 hour MIC Susceptibility system is an in vitro diagnostic product for clinical susceptibility testing of Gram negative and Gram positive organisms.

2. Indication(s) for use:
   To add Telithromycin at 0.002-16 µg/ml to the Sensititre® *Haemophilus /Streptococcus pneumoniae* HP MIC Susceptibility plate for susceptibility testing of *Haemophilus /Streptococcus pneumoniae.*

   To add Telithromycin at 0.002-16 µg/ml to the Sensititre® 18-24 hour MIC Susceptibility panel for testing *Staphylococcus aureus* and other gram positive isolates.
3. Special condition for use statement(s):
   Prescription Use Only
4. Special instrument Requirements:
   Automated readings are performed on the Sensititre® AutoReader® or ARIS® for *Streptococcus pneumoniae* and *Staphylococcus aureus.* Manual read only for *Haemophilus influenzae.*

I. Device Description:

Sensititre® MIC Susceptibility plate MIC panels are multi-well plastic microtitre plates, precision dosed with dried, stabilized antimicrobics. This is a microversion of the classic broth dilution methods and can provide both qualitative and quantitative susceptibility results. Inoculum is prepared in Mueller-Hinton broth with 2-5% lysed horse blood for testing *Streptococcus pneumoniae*, Haemophilus test medium for testing *Haemophilus influenzae* and Mueller-Hinton broth for testing *Staphylococcus aureus*. After inoculation, plates are sealed with an adhesive seal, incubated at 34-36°C for 20-24 hours and examined for bacterial growth.

The AST results may be read automatically using the Sensititre® Autoreader® or Sensititre® ARIS® or manually using the Sensititre manual viewer or SensiTouch®.

J. Substantial Equivalence Information:

1. Predicate device name(s):
   Dade Microscan®, MICroSTREP plus™ dried panel and POS MIC Panel Type 20/NEG MIC Panel Type 30
2. Predicate K number(s):
   K021037
3. Comparison with predicate:

Similarities		
Item	**Device**	**Predicate**
Intended use	an *in vitro* diagnostic product for clinical susceptibility testing of indicated organisms	an *in vitro* diagnostic product for clinical susceptibility testing of indicated organisms
Inoculum	Prepared from colonies using the direct inoculation method	Prepared from colonies using the direct inoculation method
Inoculation	Direct equated to a 0.5	Direct equated to a 0.5

method	McFarland	McFarland
Reading method	Visual growth and Auto read by instrumentation	Visual Growth only
	Differences	
Item	**Device**	**Predicate**
Type panel	antimicrobial agent serially diluted then dried	Antimicrobial diluted with M-Hinton broth supplemented with calcium and magnesium then dried
Antibiotic	Telithromycin (.002-16µl)	Different antibiotics and concentrations
Technology	Fluorescence detection of growth for automated reading, growth for manual read method.	Growth

K. Standard/Guidance Document Referenced (if applicable):

"Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems; Guidance for Industry and FDA"; NCCLS M7 (M100-S13) "Methods for Dilution Antimicrobial Susceptibility Tests for Bacteria That Grow Aerobically; Approved Standard"

L. Test Principle:

The Sensititre® Autoread System utilizes fluorescence technology to read 18-24 hour plates. The technology involves the detection of bacterial growth which is determined by generating a fluorescent product form a non-fluorescent substrate. The non-fluorescent substrate is prepared by conjugating a fluorescent compound to the specific enzyme substrates with a bond which prevents fluorescence. The substrate is added to the inoculum broth and dispensed into the test plates at the same time as the test organism. The amount of fluorescence detected is directly related to the activity of bacterial growth. The MIC is determined by observing the lowest dilution of antimicrobial agent that inhibits growth of the organism.

Alternatively, after incubation for 20-24 hours, the Sensititre viewer enables the user to read the panel manually for growth based on turbidity, haziness, or a deposit of cells at the bottom of a well. The MIC is recorded as the lowest concentration of antimicrobic that inhibits visible growth. The growth control well should be read first. If any control growth well does not exhibit growth, the test is considered invalid.

M. Performance Characteristics (if/when applicable):

1. Analytical performance:
   - *a. Precision/Reproducibility:*

     Reproducibility testing was performed on 25 *Haemophilus influenzae* and 25 *Streptococcus pneumoniae* and 25 other gram positive isolates appropriate for testing with telithromycin. These

were tested 1 time at each of three sites on each reading method. Testing was performed using Sensititre 18-24 hour Susceptibility System. This demonstrated >95% reproducibility using either the automated read method or the manual method of reading.

b. *Linearity/assay reportable range:*
Not applicable

c. *Traceability (controls, calibrators, or method):*
The NCCLS recommended QC isolate was tested daily with acceptable results with the reference method. Quality control was also performed at all sites using both the manual read method and the Autoread® method. The Sensititre® results demonstrate that the system can produce QC results in the recommended range for both the manual method of reading and the automated read method.

ORGANISM	**Conc ug/mL**	**Reference**	**Sensititre® Autoread**	**Sensititre® manual**
S. aureus ATCC 29213 Range 0.06-0.25 ug/ml	<0.06	0	0	0
	0.03	1	2	2
	0.06	58	56	55
	0.12	0	1	2
	0.25	0	0	0
	>0.25	0	0	0
Streptococcus pneumonia ATCC 49619 Range 0.004-0.03 ug/ml	<0.04	0	0	0
	0.004	0	0	0
	0.008	28	0	1
	0.015	38	62	63
	0.03	1	4	3
	>0.03	0	1	0
Haemophilus influenzae ATCC 49247 Range 1-4 ug/ml	<1	0	0	0
	1	8	0	17
	2	50	0	43
	4	2	0	0
	>4	0	0	0

Nephelometer was used at each site to standardize the inoculum and it was calibrated each time it was switched on. Colony counts were performed with a range of 7×10^4-1.4×10^6.

d. Detection limit:
Not applicable

e. Analytical specificity:
Not applicable

f. Assay cut-off:
Not applicable

2. Comparison studies:

a. Method comparison with predicate device:

Broth reference panels prepared according to the recommendations of the NCCLS were used to compare to the Sensititre® panel results. Testing was performed at 3 sites and included fresh and stock clinical isolates and a set of challenge organisms. The following are the comparative results for the gram positive panel for the manual read only.

	total	EA	%EA	Total evaluable	EA of evaluable	%EA evaluable	CA	%CA	#R	min	maj	vmj
gpos.	270	266	98.7	189	184	98.7	134	100	52	0	0	0
S.p.	362	358	98.9	362	358	98.9	361	99.7	0	1	0	0
H.i.	354	354	100	353	353	100	350	98.9	1	4	0	0

gpos = gram positive organisms, **S.p.** = Streptococcus pneumoniae, **H.i.** = Haemophilus influenzae

EA-Essential agreement
CA-Category agreement
R- Resistant isolates
maj-major discrepancies
min-minor discrepancies
vmj-very major discrepancies

The following are the comparative results for the Automated Read method.
Comment: H.i. can not be read by automated read method.

	total	EA	%EA	Total evaluable	EA of evaluable	%EA	CA	%CA	#R	min	maj	vmj
Gpos.	267	257	95.2	186	176	94.4	134	100	52	0	0	0
S.p.	362	357	98.6	362	357	98.6	362	100	0	0	0	0

EA is when there is agreement between the reference method and the Sensititre™ panel within plus or minus one serial two-fold dilution of antibiotic. CA is agreement of interpretive results (SIR) between a new device under evaluation and an NCCLS standard reference method. The %EA is acceptable when compared to the reference method as described in the FDA guidance document, "Class II Special Controls Guidance Document: Antimicrobial Susceptibility Test (AST) Systems; Guidance for Industry and FDA".

The FDA approved indication for use of telithromycin when testing Staphylococcus aureus is for methicillin and erythromycin susceptible strains only. The 49 Staphs resistant to telithromycin were 48 MRSA and 1 MSSA but erythromycin resistant.

b. Matrix comparison:
Not applicable

3. Clinical studies:
   a. Clinical sensitivity:
   Not applicable

   b. Clinical specificity:
   Not applicable

   c. Other clinical supportive data (when a and b are not applicable):
   Not applicable

4. Clinical cut-off:
   Not applicable

5. Expected values/Reference range:
   Staphylococcus aureus $\leq$ 0.25 (S)
   Streptococcus pneumoniae $\leq$ 1 (S), 2 (I), $\geq$4 (R
   Haemophilus influenzae $\leq$ 4 (S), 8 (I), $\geq$16 (R
   The Interpretative criteria, QC isolates and the expected ranges are the same as recommended by FDA. All values will be included in the package insert.

N. Conclusion:
The submitted information in this premarket notification is complete and supports a substantial equivalence decision.